

Climate Change Vulnerability Assessment and Adaptation Strategy

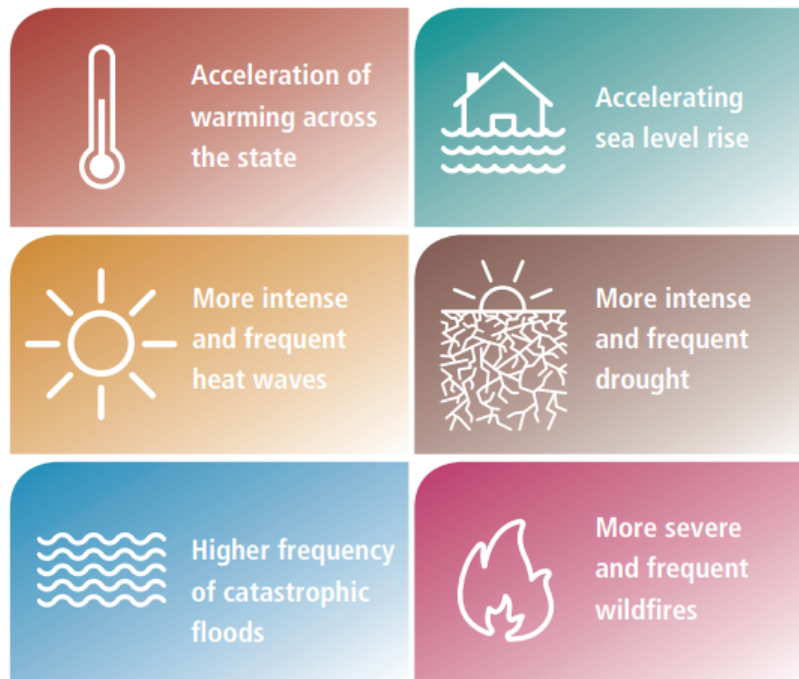
*Jeff Henderson, Deputy Executive Officer
Kate Anderson, Senior Environmental Planner*

Delta Stewardship Council

February 21, 2019



Climate Change & the Delta



Which are likely to increase stresses to:



Agriculture



Ecosystems



Water resources



Land use and community development



Transportation



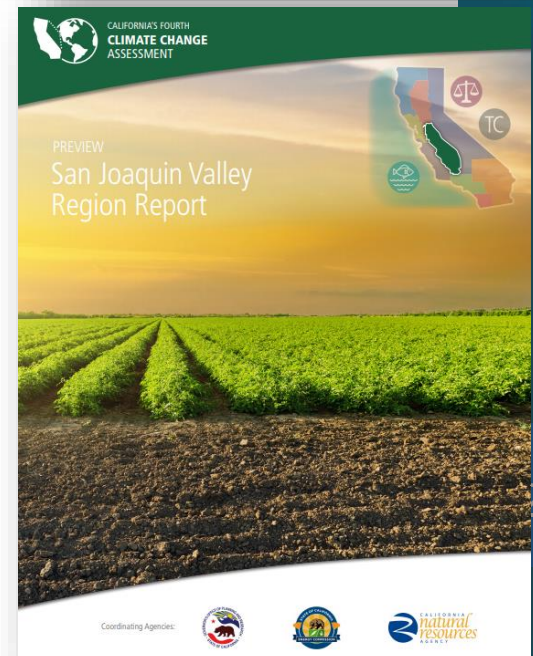
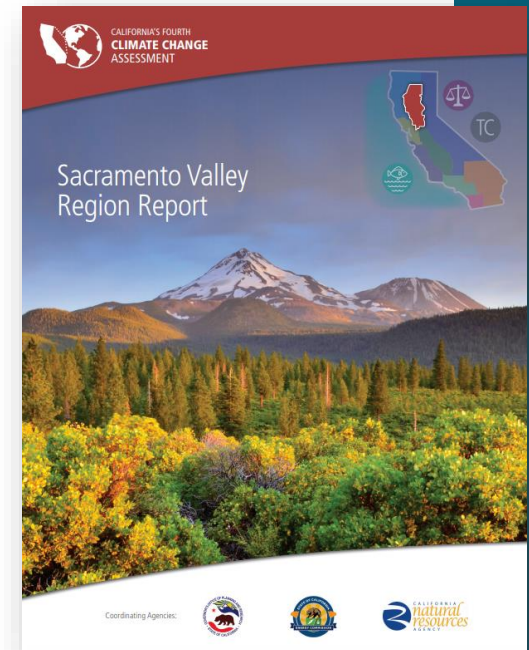
Energy



Public health



Climate justice



Problem Statement

“Climate changes, bringing higher sea levels, temperatures, and evapotranspiration, as well as shifts in inflows and species introductions will bring fundamental changes in the composition of **Delta ecosystems** and the challenges for **water supply and quality management**...

Climate change is affecting all Delta problems and will bring new problems. These urgent problems provide an opportunity to re-fashion how the State develops, manages, and employs scientific and technical information for Delta policy and management.”

- Delta Independent Science Board draft letter to DPIIC, January 2019

Currently, there is **no regional Delta assessment** of climate change vulnerabilities or an adaptation strategy.

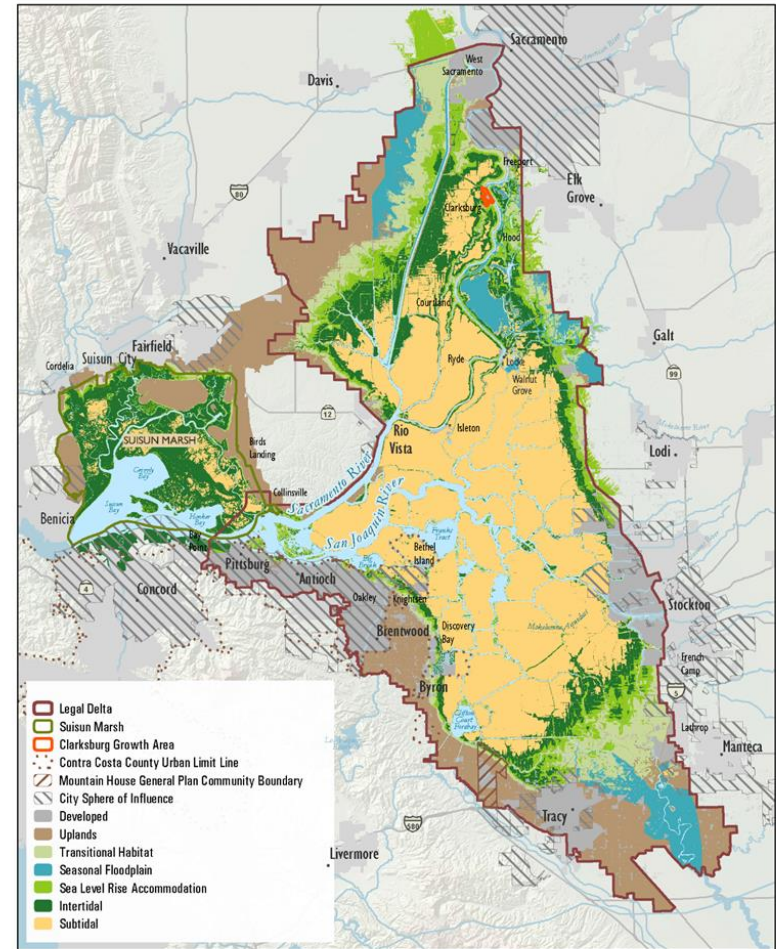
Today's Discussion

- Provide Project Overview
 - Background, Goals, Process, Timeline
- Discussion:
 - Solicit feedback on *Draft Delta Climate Change Resilience Goals*
 - Does the project adequately reflect state interests in the Delta?
 - What is Council level of interest in project engagement going forward?

Project Background

- Climate change in the **Delta Reform Act**:
 - “the future impact of climate change and sea level rise” in restoration planning to 2100
 - “the effects of climate change and sea level rise on the three state highways that cross the Delta”
- Climate change in the **Delta Plan**
 - 2 regulatory policies: restoration planning, some residential development (ER P2, RR P2)
 - 5 recommendations: i.e. update Suisun Marsh Plan (WR R9, RR R7, ER R2, ER R5)
- **Science Action Agenda**
 - 2 Priority Science Actions: species refugia during extreme climate events (AA 3B, AA 4B)

Habitat Types Based on Elevation, Shown with Developed Areas in the Delta and Suisun Marsh



Advances since 2013:

Science

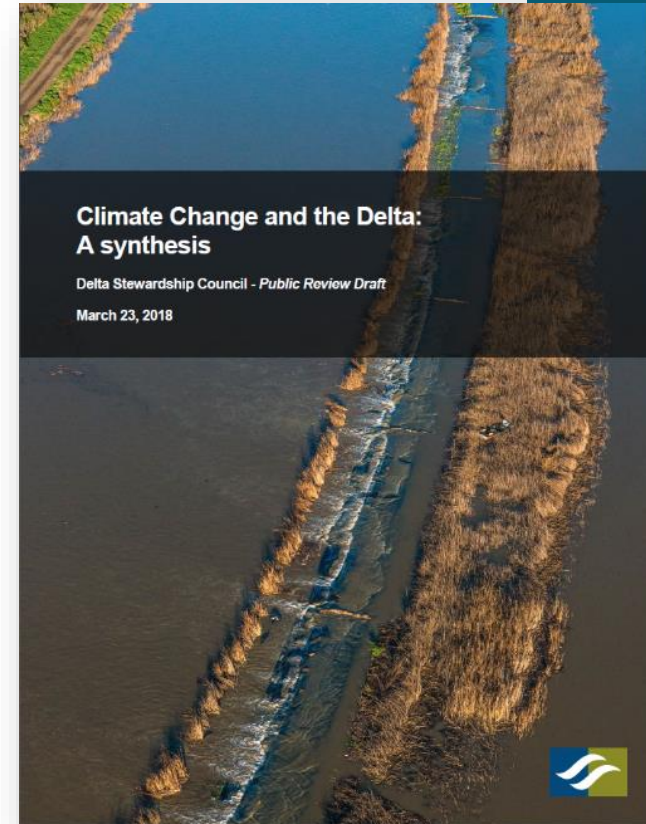
- Updated OPC Sea Level Rise Guidance (2018)
- California 4th Climate Change Assessment

Policy & Regulations

- Delta Plan amendments
- EO B-30-15, SB 379, SB 246, AB 398
- Local government plans (Solano, San Joaquin, Sacramento, Yolo, Contra Costa, Stockton)
- SWRCB 2017 Climate Resolution

Programs

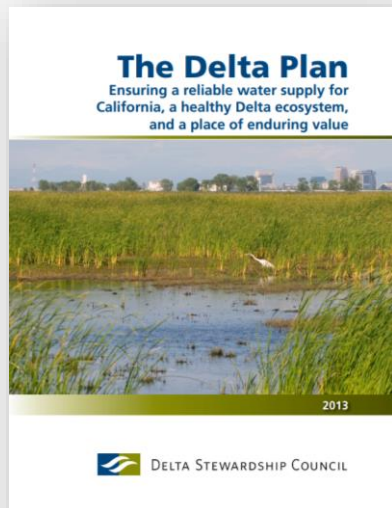
- San Francisco Bay Conservation and Development Commission (BCDC) Adapting to Rising Tides (ART) for Eastern Contra Costa



A synthesis of over **200** journal articles and technical reports on climate change as it relates to ecosystem restoration was conducted in early 2018 to support the Delta Plan Ecosystem Amendment

Basic Project Approach

Reflect the Delta Reform Act and the Delta Plan



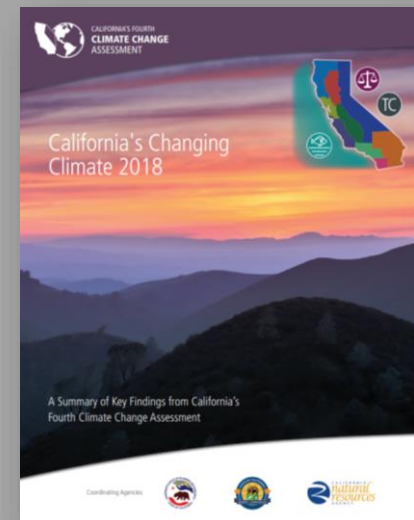
Apply State agency guidance



Lessons learned from the Adapting to Rising Tides Program



Integrate best available science



Project Overview

Phase 1: Vulnerability Assessment

- Characterize climate change impacts and risk
- Evaluate impacts on assets & resources

Phase 2: Adaptation Strategy

- Evaluate potential responses that could be implemented that would achieve resilience goals

Process & Roles

Council

Technical
Advisory
Committee (TAC)

Stakeholder
Workgroup

Public
Awareness &
Communications

Draft Delta Climate Change Resilience Goals

Balanced Approach

Society and Equity

Economy

Environment

Governance

**More Reliable
Water Supply**

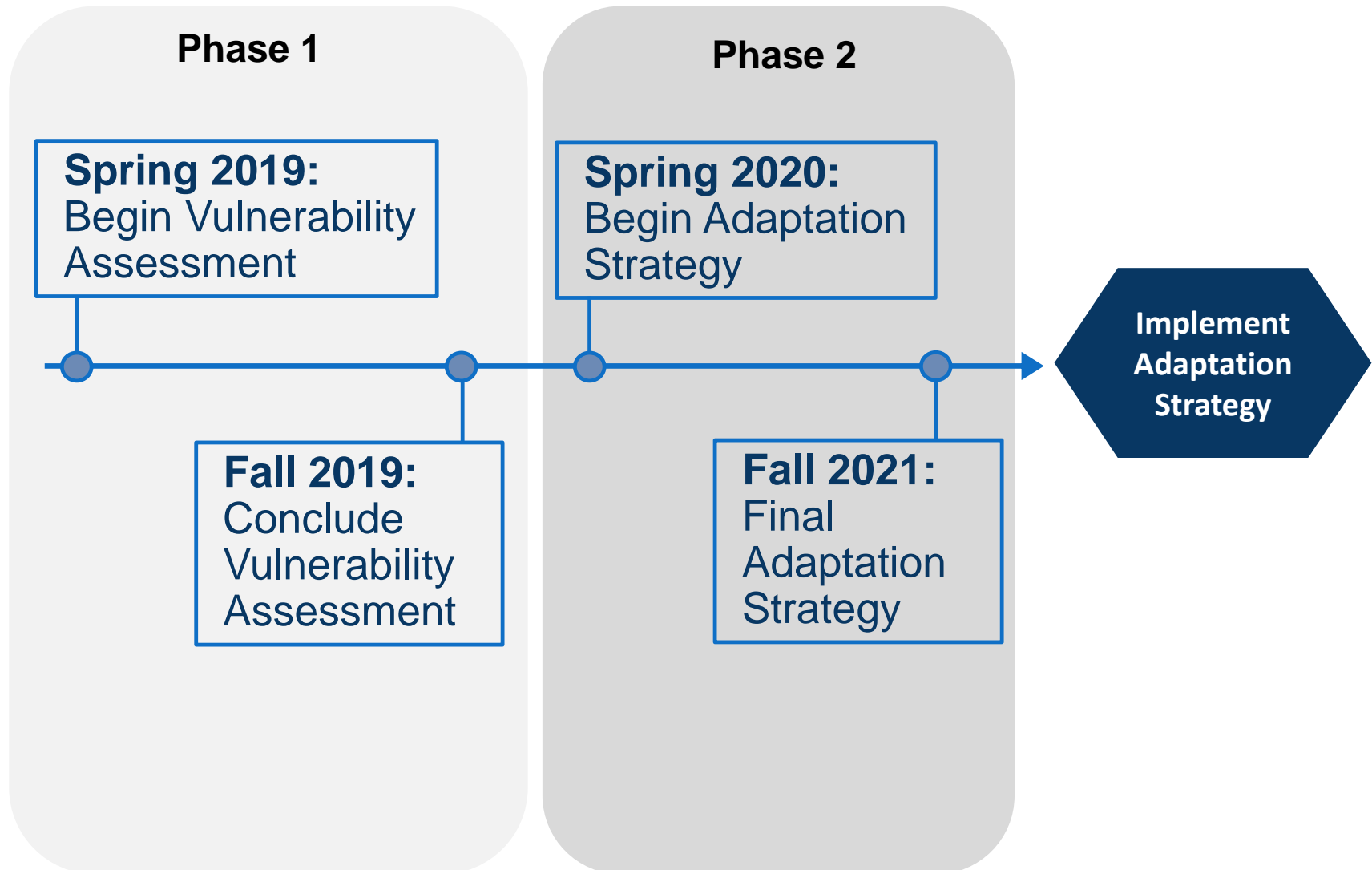
**Ecosystem
Restoration**

**Protect / Enhance
Delta as Evolving
Place**

Resilience is “the capacity of any entity – an individual, a community, an organization, or a natural system – to prepare for disruptions, to recover from shocks and stresses, and to adapt and grow from a disruptive experience”

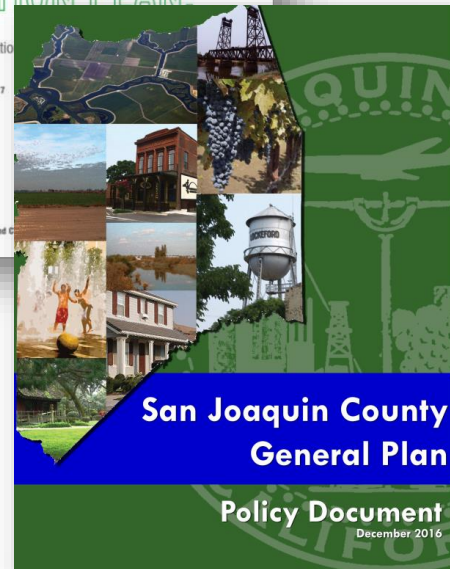
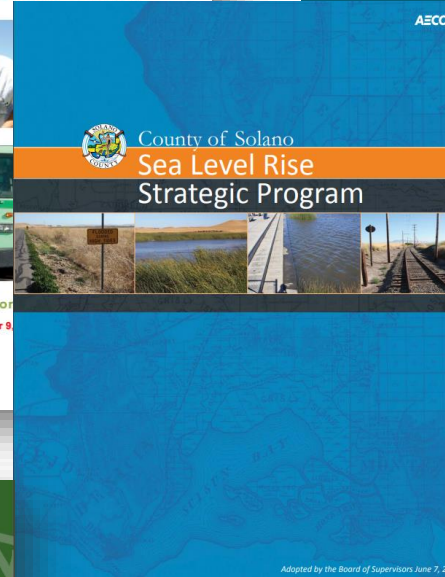
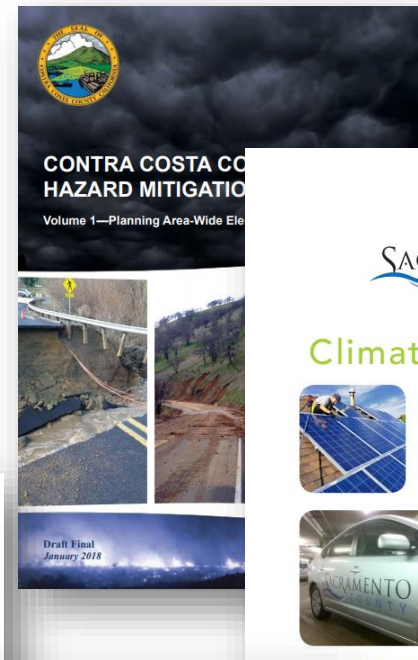
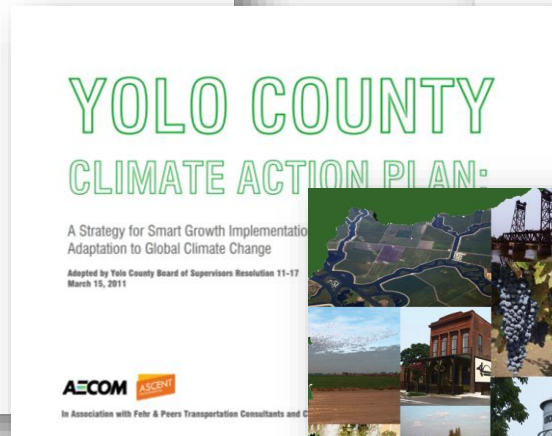
- Governor’s Office of Planning and Research (OPR)

Project Timeline



Local Government Climate Change Efforts

- Engagement is a critical project objective
- Regional climate collaboration is goal of many local plans



Project Awareness - Initial Outreach

State Agencies



SACRAMENTO-SAN JOAQUIN
DELTA CONSERVANCY



Local government



SACRAMENTO
COUNTY



Workgroups and collaborations

- Integrated Climate Adaptation and Resiliency Program (ICARP) Council
- BCDC ART Regional Working Group
- Delta Science Program Social Science Task Force
- Delta as Place Workgroup
- RAND Decision Making Under Deep Uncertainty
- Integrated Modeling Steering Committee (IMSC)

Technical Advisory Committee

Members <i>*in alphabetical order, alternates in italics</i>	Affiliation
John Andrew, <i>Julia Ekstrom</i>	DWR- Statewide Infrastructure Investment Branch
Casey Brown	University of Massachusetts - Hydrosystems Research Group
Dan Cayan	Scripps Institute of Oceanography
Gilbert Cosio	MBK Engineers
Steve Deverel	Hydrofocus
Melinda Dorin	Delta Protection Commission
Michael George	SWRCB, Delta Watermaster
Ted Grantham	UC Berkeley Natural Resources Conservation
John Herman	UC Davis School of Engineering
Nuin-Tara Key	Governor's Office of Planning and Research
Noah Knowles	USGS
Josue Medellin-Azuara	UC Merced
Brett Milligan	UC Davis, Department of Human Ecology
Nicky Sandhu	DWR- Bay Delta Office
Stuart Siegel	UC San Francisco
Brian Vaughn	Public Health Director, Yolo County Health & Human Services Agency
Sam Veloz	Point Blue

Today's Discussion

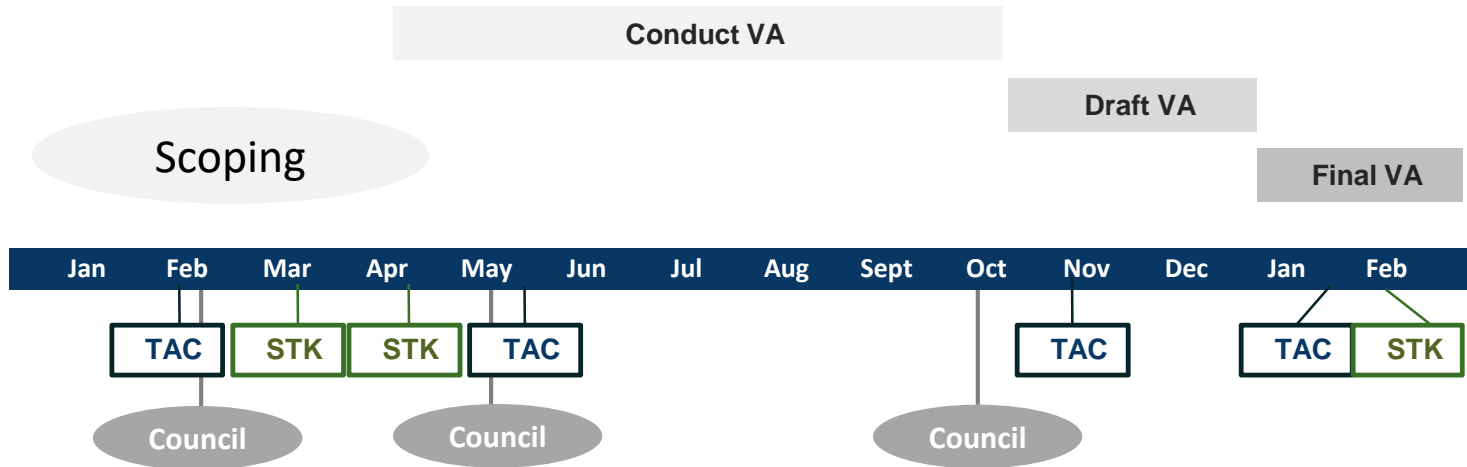
- Feedback on *Draft Delta Climate Change Resilience Goals*:
 - Are these goals complete? What is missing?
- Does the project reflect state interests?
 - Where should staff focus efforts: economic risk, risk to infrastructure, people, property, state water supply reliability, ecosystem?
- What is Council level of interest in project engagement going forward?
 - Provide direction on potential adaptation alternatives
 - Hear from practitioners who have conducted climate change vulnerability assessments and adaptation strategies in other areas

Detailed Project Timeline

Phase 1

Vulnerability Assessment

2019 - 2020



Phase 2

Adaptation Strategy

2020-2021

